U.S. Fish and Wildlife Service Actions Related to the Information Quality Act and Florida Panther

On May 4, 2004, Public Employees for Environmental Responsibility submitted a request to the U.S. Fish and Wildlife Service alleging violations of Section 515 of Public Law 106-554, commonly referred to as the Information Quality Act. After review of the allegations, the Director committed to completing a series of tasks. The actions we have taken to date to address these issues are described below.

Task 1
Immediately update the panther-related sections of the Multi-Species Recovery Plan to incorporate appropriate recommendations of the Scientific Review Team and publish those revisions for public comment no later than December 2005.

Response
The Service recently convened a recovery team composed of multiple government and non-government partners to update the 1995 Florida Panther Recovery Plan. The team is now developing a revised recovery plan that incorporates the best available science and addresses appropriate recommendations from the Scientific Review Team (SRT), an independent group convened to comprehensively review and critically evaluate panther scientific literature and data analyses and offer recommendations to address uncertainty. The recovery plan is scheduled to be published for public review and comment by December 31, 2005. To ensure this goal is achieved, the team has scheduled meetings once each month through September 2005. When complete, this recovery plan will update the Florida Panther Recovery Plan of 1995 and will supersede the panther section of the Multi-Species Recovery Plan (MSRP), eliminating the need to update the panther portion of the outdated document.

Task 2
Develop an appropriate disclaimer to accompany further dissemination of the MSRP in the interim.

Response
The South Florida Ecological Services Office has posted the disclaimer below on the website linking to the MSRP http://verobeach.fws.gov/Programs/Recovery/vbms5.html.

"The MSRP, completed by the Service in 1999, contains information on the biology, ecology, status, trends, management, and recovery actions for 68 federally listed species found in south Florida, as well as the ecology and restoration needs of 23 natural communities in the region. This document was prepared to recover threatened and endangered species in south Florida and help restore and maintain biodiversity of natural communities. The MSRP was designed to assist with project planning, management actions, and environmental compliance, and it provides information for use in interagency consultations and habitat conservation plans. More than 200

representatives from agencies, academia, and private organizations worked together to assist the Service in preparing the MSRP. Public review and comment of the draft occurred over eight months before the MSRP was approved by the Service.

Because the MSRP was published approximately five years ago, the Service acknowledges that portions of it, including some sections related to the Florida panther, are now outdated. To update Florida panther science, the Service and State of Florida convened the independent SRT (Beier et al. 2003), which questioned some of the analyses and conclusions regarding Florida panther habitat in the MSRP. The description of habitat in the Florida panther section of the MSRP (p.4-120), for example, while providing a useful description of habitat needs in south Florida, does not clearly or definitively describe panther habitat in the detail available today.

In particular, the MSRP mainly discusses "preferred" and "avoided" panther habitat based upon telemetry and early work by Dave Maehr (e.g., Maehr 1990) and other researchers (e.g., Maehr et al. 1991). To address this point, the SRT suggested reanalyses of panther telemetry data. The SRT encouraged using panthers, not panther locations, as sampling units, and analyzing data on nocturnal locations of Florida panthers throughout their range to obtain a complete picture of habitat use (Beier et al. 2003). The Service recognizes the value of suggestions identified in the SRT report, and is working with researchers and other partners to describe Florida panther habitat as clearly as possible.

At this time, the Service believes the MSRP still provides a comprehensive, general overview of panther biology in south Florida. Hence, we continue to use the information within the MSRP, along with other available scientific and commercial information, in our decisions, evaluations, reviews, and analyses regarding the panther. However, we are careful not to rely on those portions of the MSRP that no longer represent the most up-to-date scientific information available, especially as they relate to the use of panther habitat descriptions.

To help address the out-dated information in the MSRP, the Service recently convened a recovery team composed of multiple government and non-government partners to revise the 1995 Florida Panther Recovery Plan. The team is now developing a revised recovery plan that incorporates the best available science and addresses appropriate recommendations from the SRT. The plan is scheduled to be published for public review and comment by December 31, 2005. To ensure this goal is achieved, the team has scheduled meetings once each month through September 2005. When complete, the Service expects the recovery plan to supersede the panther section of the MSRP, eliminating the need to update the panther portion of the outdated document."

Task 3
Suspend the dissemination of the December 19, 2002, Draft Landscape Conservation Strategy (LCS). The Regional and South Florida Ecological Services Office web pages will post a notification of this suspension.

Response
The South Florida Ecological Services Office has posted the notice below on its website.

<u>Dissemination of the Landscape Conservation Strategy for the Florida Panther Suspended</u>
The Florida Panther Subteam of the Multi-species/Ecosystem Recovery Implementation Team (MERIT) was charged with developing a landscape-level strategy for the conservation of the Florida panther. The Panther Subteam produced the "Landscape Conservation Strategy for the Florida Panther in South Florida (LCS)" in December 2002 and provided it to the Service. Upon receipt, the Service began to use the information in the LCS in its decision making processes and documents. Since then, some of the science and findings in the LCS have been challenged.

The Service will no longer disseminate the LCS because of scientific shortcomings identified by Dr. Paul Beier and others, which broadly fit into the following categories: errors associated with telemetry data and interpretation; limitations of telemetry-based analyses to inferences on daytime habitat use only; compositional analyses for determining habitat use and preference; sensitivity analyses for modeling scenarios; and methods of evaluation of potential habitats north of the Caloosahatchee River, and habitat capacity of south Florida. More specifically, Beier recommended reanalyses of forest patch size, distance from forest patches, and distance from urban areas by using the animal as the sampling unit, comparing the area used to that available to the animal, and buffering in telemetry location error. Although Beier recommended more rigorous analyses and believed that the net result of his comments would be a better refined definition of panther habitat, he suggested that this would likely have little effect on the final potential habitat map.

Many of the Panther Subteam members have worked together to refine the methodology, further analyze the data, and better define the results of the LCS as a draft article for a professional peer-reviewed journal. To date, the authors known collectively as Kautz et al. have responded to two sets of peer review edits on their draft article and are waiting to hear from the journal editor. In addition, the authors have considered the comments provided by Beier (2003) on the LCS and the recommendations offered by the SRT (Beier et al. 2003). As predicted by Beier, these reanalyses did not negate or invalidate the draft LCS for its intended purposes.

The Service is evaluating the limitations identified in the LCS further and developing recommendations for addressing the issues identified by the SRT. The Service is committed to addressing these issues comprehensively, either by incorporating appropriate information into the recovery plan now in development, or in some other demonstrable manner. In the meantime, Kautz et al. (In Review) contains the same data as the LCS, but it addresses many of the comments of Beier and the SRT, contains more rigorous analysis, and is being peer reviewed an additional time.

Task 4
Take appropriate measures to address comments by Dr. Paul Beier and SRT recommendations in any future dissemination of information.

Response
The Service has developed a response to these comments and other related issues, and has included the information in biological opinions for panthers completed since the Director's March 16, 2005 letter to Jeff Ruch, Executive Director of Public Employees for Environmental Responsibility. An example of this detailed information is available in Attachment 1. In

addition, the Service has developed a tracking document for SRT recommendations and our responses, and is updating it as we make progress.

Task 5
By August 1, 2005, update Service files on its biological opinions to correct the portions that erroneously equated the Minimum Viable Population of panthers and the Current Verified Population. A copy of this correction will be sent to the Action Agency and posted on the Region and South Florida Ecological Services Office web pages.

Response
The Service is reviewing past biological opinions, and will correct the portions that erroneously equated the Minimum Viable Population of panthers and the Current Verified Population by August 1, 2005. In addition, the Service will send a copy of the correction to the Action Agency and post the information on the Region and South Florida Ecological Services Office websites.

To help address the questions raised on some out-dated and deficient scientific sources, the U.S. Fish and Wildlife Service has added variations of the following discussion to biological opinions on the Florida panther that have been issued since the Director's March 16 letter to Mr. Jeff Ruch, Executive Director of Public Employees for Environmental Responsibility.

Use of Best Scientific and Commercial Information by the Service

The Service uses the most current and up-to-date scientific and commercial information available. The nature of the scientific process dictates that information is constantly changing and improving as new studies are completed. The scientific method is an iterative process that builds on previous information. As the Service becomes aware of new information, we will ensure it is fully considered in our decisions, evaluations, reviews, and analyses as it relates to the base of scientific knowledge and any publications cited in our documents.

Specifically, there is one such document cited in the biological opinion the Service acknowledges has been affected in its cited form by new scientific information. The Service has taken these new sources of information into account when using this document to help guide our analysis and decisions. This document is the Multi-Species Recovery Plan (MSRP) of 1999 (Service 1999). In addition, the Service has examined Kautz et al. (In Review) for its scientific validity, specifically with regards to comments and recommendations by other reviewers as discussed below.

South Florida Multi-Species Recovery Plan

The MSRP was designed to be a living document, and it was designed to be flexible to accommodate changes identified through ongoing and planned research, and to be compatible with adaptive management strategies. These principals are set forth in both the transmittal letter from the Secretary of the Interior and in the document itself. As predicted, this is what indeed occurred in the intervening years since the MSRP was published. The Service uses the MSRP in the context it still presents useful information when taken in conjunction with all the new scientific information developed subsequent to its publication.

Kautz et al. (In Review)

The Florida Panther Subteam was charged with developing a landscape-level strategy for the conservation of the Florida panther population in south Florida. The Subteam produced the draft Landscape Conservation Strategy for the Florida Panther in South Florida in December 2002 and provided it to the Service. Upon receipt, the Service began to use the information in the draft Landscape Conservation Strategy in its decision making processes and documents since it was part of the best scientific information available to the Service at the time. Since then some portions of the science and findings in the draft Landscape Conservation Strategy have been challenged. Many, but not all, of the Subteam members have refined the methodology, further analyzed the data, and better defined the results of the Landscape Conservation Strategy into a draft article, referred to here as Kautz et al. (In Review), for submission to a professional peer-

reviewed journal, Biological Conservation. To date, the authors have responded to two sets of edits on their draft article and are awaiting response from the journal editor regarding acceptance of the manuscript for publication. In addition, the authors have considered the comments provided by Beier (2003) on the Landscape Conservation Strategy and the recommendations provided by the Scientific Review Team (SRT) (Beier et al. 2003) as discussed below. Dr. Jane Comiskey, one of the co-authors of Kautz et al. (In Review), has expressed some concerns about the manuscript and we have addressed her concerns below as well. We have also addressed issues relating to the ESA and Information Quality Act.

Beier (2003) Comments on the Draft Landscape Conservation Strategy

Beier provided 37 comments on the Subteam's Landscape Conservation Strategy. Kautz et al. (In Review) addressed all of Beier's comments except those discussed below.

1. Include a statement that when analyses using nighttime data are available, this picture probably will change.

This statement is not in the manuscript, but in this and other biological opinions, the Service acknowledges that nighttime and 24-hour data are generally not readily available at this time. Data from GPS collars will be considered when found to be reliable and available. Availability of nighttime or 24-hour data may possibly change some conclusions about panther habitat in the future. In analyses of puma habitat in California, Beier (2003) found that puma show markedly broader habitat use and selection at night compared to daytime. We expect that when GPS-collar data become more available, there will likely be a better understanding of habitat use at night. However, the Service does not solely rely on daytime telemetry in making its decisions regarding panther habitat. The Service considers panther habitat to include all areas required for the panther to live out its full life-cycle, including areas providing food and shelter and supporting characteristic movement such as hunting, breeding, dispersal, and territorial behavior.

2. Explain the witch's finger jutting eastward from the Primary Zone. No panther is going to have a home range 10 miles long and 400 meters wide. Buffer this so that it is at least 1 mile wide at its narrowest points, and 4 to 5 miles wide in most areas. I support the idea of making this primary habitat, but strongly feel that it does not make sense to make it so narrow.

This was not addressed. This comment relates to the slender portion of the Primary Zone that protrudes eastward at the border of Palm Beach and Broward Counties and the recommendation by Beier that it be buffered to be more inclusive. While Kautz et al. (In Review) did not make this requested modification, the Service will address this omission in biological opinions, as appropriate. The Service is careful to consider Primary, Dispersal, and Secondary Zones and other panther habitat, along with additional high-quality scientific and commercial data, in our analyses and evaluations.

3. Secondary Zone: Overall, the approach is *reasonable*, but not *rigorous*. We will probably never have data to make this a rigorous analysis, so it would be unreasonable to demand it.

However, if you ran a cursory sensitivity analysis, you can determine how the map varies under different assumptions about cutoff points and relative weights.

According to Kautz et al. (In Review), the Secondary Zone is defined as natural and disturbed lands adjacent to the Primary Zone that may have potential to support an expanding panther population, especially if habitat restoration were possible. A preliminary boundary of a Secondary Zone was originally drawn on a hard copy map by the Multi-species Ecosystem Recovery Implementation Team (MERIT) Panther Subteam. The landscape context of the draft Secondary Zone was evaluated by combining a set of 30-meter (m) pixel grids created to measure three habitat-related variables (i.e., proximity to Primary Zone, proximity to a forest plus buffer patch, forest plus buffer patch size) and three land-use variables (i.e., proximity to urban lands, intensity of land use, and road type and density). Pixels in the six data layers were assigned scores of 1 to 10, with 10 representing the best case for panthers. Equal interval or progressively increasing or decreasing increment functions were applied to each data layer as deemed appropriate. The Secondary Zone boundary was finalized by adjusting the preliminary boundary to conform to results of the landscape context analysis and to land use changes as indicated by recent satellite imagery. To our knowledge, a cursory sensitivity analysis varying the scores assigned to the different variables within each data layer was not run. Therefore, we do not know how a map of the Secondary Zone would vary under different assumptions about cutoff points and relative weights. However, as a group, the Subteam reviewed the draft Secondary Zone boundaries in relation to the results of the context analyses and recent satellite imagery, and achieved consensus on the adjusted boundaries that best met the definition of the Secondary Zone. Therefore, the Service does not believe the lack of this cursory sensitivity analysis affects the scientific validity of a Secondary Zone nor the Service's ability to use it in biological opinions.

4. A density of 1 panther per 11,000 hectare (ha) is a strange inference from this simple descriptive statistic. The 11,000 ha is simply total area divided by the number of panther home ranges in the area. This is not a sound approach toward estimating minimum forest area for use by panthers.

In the Landscape Conservation Strategy, the MERIT Panther Subteam attempted to identify lands north of the Caloosahatchee River for their capacity to support one or more groups of reproducing panthers. In that process, they assumed that large forest patches, at least 11,000 ha in size, would be needed. This assumption was based on an estimate of population density in optimal habitat given by Maehr et al. (1991a).

In conducting a compositional analyses, Kautz et al. (In Review) determined that panther use of forest patches within fixed kernel home ranges south of the Caloosahatchee River differed significantly from random. The smallest forest patch size classes occurred within home ranges in higher proportions relative to their availability than larger forest patch sizes. With this new knowledge, Kautz et al. (In Review) did not repeat the erroneous assumption that forest patches at least 11,000 ha in size are required by panthers. Kautz et al. (In Review) did use 1 panther per 11,000 ha as a rough density estimate along with a density estimate derived from their own analysis (1 panther per 12,919 ha) to provide estimated ranges for the potential number of

panthers that could be accommodated by the current configuration of the Primary, Dispersal, and Secondary Zones.

5. Habitat Capacity, "defined as areas with pixel values >3." This definition, it seems, would result in a region with Swiss-cheese holes and outlier bubbles of habitat. Was there a step that involved smoothing to create a "smooth" map? If so, describe that step. If not, acknowledge and describe the nature of the resulting map.

For the purposes of their study, the Subteam developed an estimate of panther population density. Minimum convex polygons of panther home ranges were generated for all Florida panthers by year based on telemetry records through early in 2000 (n=49,889 telemetry locations, 1981 to 2000). Each polygon was converted to a 100 m pixel grid, and the resulting grids were summed. The region of most consistent panther occupancy for the period of record was defined as areas with pixel values ≥ 3. This step excluded areas used only once or twice by transient animals. To estimate population density, the total land area within the resulting region of panther occupancy was divided by 62, the estimated size of the panther population in 2000 (McBride 2000). Using this method, the region of most consistent panther occupancy from 1981 through early 2000 covered 800,951 ha. Based on the estimated panther population of 62 individuals, population density was one panther per 12,919 ha in 2000. Kautz et al. (In Review) did not address the shape or character of the resulting map, nor whether its creation involved "smoothing." However, the resulting size of area of occupancy and population density they report are consistent with other published information and are considered the most current and up-to-date scientific information available to the Service.

6. "Region of panther occupancy was divided by 62, the estimated size of the panther population in 2000." Need to be specific about whether this refers to resident adults, resident breeding adults, adults plus independent juveniles, or total panthers, including kittens. McBride's estimate, I believe, was "adults plus independent juveniles" and is thus analogous to the estimated density provided by Maehr et al. (1991a).

This was partially addressed. Kautz et al. (In Review) states that "…estimates place the population at 80-100 adults and subadults (Land and Lacy 2000; McBride 2001, 2002, 2003)." Later, where Kautz et al. (In Review) use the estimate of 62 panthers, McBride is cited. According to Kautz et al. (In Review), "To estimate population density, the total land area within the resulting region of panther occupancy was divided by 62, the estimated size of the panther population in 2000 (McBride 2000)." McBride (2000) clearly indicates that 62 panther number "…includes collared and uncollared, adult and subadult, part-Texas and pure Florida panthers. It does not include kittens at the den site, nor does it include extrapolations." The Service understands that the panther population of 62 in 2000 included adults plus subadults and not kittens at the den.

7. "A population of this size would have N_e of ~ 50 breeding adults." This statement needs explanation based on published data, otherwise delete it. N_e is a notoriously difficult parameter to estimate.

No similar statement is in Kautz et al. (In Review) and N_e is not mentioned in the text. However, N_e is in Table 5 of Kautz et al. (In Review). The presence of N_e in Table 5 does not affect the scientific validity of the document nor the Service's ability to use it. The effective population size (N_e) is the number of adults in a population contributing to offspring in the next generation. Although we understand that N_e is difficult to estimate, we believe use of it is helpful in the population guidelines given in Kautz et al. (In Review). The Service realizes that the effective population size is generally smaller than the census size and is often much smaller than the census size. Although not specifically discussed in our biological opinions, we factor this into our analyses.

8. It is hard to believe that we cannot "rank agricultural lands as panther habitat" with data already in hand. Don't we already know that unimproved pasture > improved pasture > citrus > row crops?

This has been addressed to some degree. Table 1 of Kautz et al. (In Review) does rank some agriculture lands but not to the level of detail in the comments. The Service has factored the relative value of cover types/habitat types into our analyses and decision-making process during project evaluations and reviews.

9. Please change "long-term survival of the Florida panther" to "long-term survival of the existing population of the Florida panther."

This was not addressed in Kautz et al. (In Review). However, the Service realizes that a single Florida panther population exists in south Florida. Our decisions in this biological opinion and others are based upon ensuring the survival of the panther population in south Florida while working toward what is needed for recovery throughout the panther's historic range.

Scientific Review Team Report

1. Beier et al. (2003) states that "Telemetry data have been collected for Florida panthers over a long time period (since 1981), but in some analyses of habitat use, the vegetation maps may not have been updated and ground-truthed to stay current with analyses of telemetry data. The SRT has insufficient information to know to what degree this may be a problem, but recommends attention to this potential problem in future analyses."

Kautz et al. (In Review) states that "While researchers have continued to collect telemetry data for radio-collared panthers through the date of this writing, we are reporting the results of the only telemetry data that were available at the time of our collaborative work, and the telemetry data we used were closer in time to the date of the land cover data sets used for habitat analysis." In relation to how this point was addressed in the Kautz et al. (In Review) manuscript, Randy Kautz (Florida Fish and Wildlife Conservation Commission [FWC], personal communication, 2004) stated that he "spent several hours at one point zooming in on panther telemetry against a backdrop of recent land cover data, and…found very few obvious examples of this being a problem. My own take was that the volume of telemetry data of over 55,000 records was so huge that any currency problems comprised a very small error factor." The Service concurs with Randy Kautz's conclusion and believes that currency errors in such a large sample size would not be significant.

2. Beier et al. (2003) strongly recommends the use of compositional analyses (Aebischer et al. 1993) or another statistically appropriate method to compare the distributions of forest patch sizes available to panthers to those used by panthers.

Kautz et al. (In Review) used compositional analysis to assess the effect of forest patch size on panther habitat use within the study area south of the Caloosahatchee River. This was accomplished by reclassifying upland and wetland forest types into one forest class, determining patch size, and assigning individual forest patches to size classes according to an equal area increment function. Differences in proportions of forest patches within each home range relative to the entire study area were then tested. Kautz et al. (In Review) found that forest patches of all sizes are important to panthers and that the smallest classes of forest patches are especially important.

3. Beier et al. (2003) states "The estimate of 84% to 87% kitten survival (Maehr and Caddick 1995) is indefensible for several reasons."

Randy Kautz (FWC, personal communication, 2004) stated that "Our Population Viability Analysis (PVA) models used more recent and realistic survival rates of 0.62." This rate was developed by the use of data collected by FWC researchers and constitutes the best available data at this time. This issue is further addressed below under Questions 2 and 6 within in the section addressing comments from Dr. Jane Comiskey.

4. Beier et al. (2003) states "The SRT recommends that any future PVA models should be built from scratch and explicitly consider parameter uncertainty, variation (demographic, environmental) in parameters, and uncertainty in key functional relationships such as density dependence and the effects of inbreeding."

Randy Kautz (FWC, personal communication, 2004) stated that "We used Risk Assessment, Management, and Audit Systems (RAMAS), and I believe we are happy with the results. Our use of RAMAS preceded the SRT report. I personally think that enough PVAs have been done to give us a pretty good picture of the survival potential of the population, but no doubt the next generation of PVA modelers will improve on past work." The Service concurs with this statement and believes that Kautz et al. (In Review) should be considered among the most current and up-to-date scientific and commercial information available, and we will use this analysis and other relevant information in our biological opinions until new, scientifically peer reviewed and verified data are present.

Dr. Jane Comiskey's February 2005 Comments on Kautz et al. (In Review)

Taken as a whole, Dr. Comiskey's concerns dealt primarily with the addition of text and explanation to Kautz et al. (In Review) if it was to be used as a substitute for the Landscape Conservation Strategy. The Service agrees that Kautz et al. (In Review) is not a stand alone document and must be used in conjunction with the body of scientific literature regarding the panther, including the work of the Panther Subteam.

1. Kautz et al. (In Review) lacks the needed ecological and environmental context to replace the full Landscape Conservation Strategy.

This may be correct in some instances. However, where the Service has cited this document in place of the Landscape Conservation Strategy we have ensured that the information is indeed included in Kautz et al. (In Review) and not part of the larger, more detailed Landscape Conservation Strategy. We believe that Kautz et al. (In Review) captures the major findings of the Landscape Conservation Strategy. Additional ecological and environmental context that is specific to an individual proposed project and proposed project site is included in biological opinions.

2. "The best we know given the current science at hand" indicates that some model assumptions are violated in the existing population and that parameter value estimates for reproductive rates and kitten survival are likely too optimistic. We need to acknowledge that in using model results.

Some parameter value estimates for reproductive rates and kitten survival may be too optimistic. Some estimates of kitten survival have been too high (e.g., 0.80) while others may be too low. It would have been our preference to see a range of kitten survival rates used in the model between the Conservative, Moderate, and Optimistic scenarios as was done with other reproductive parameters used in Kautz et al. (In Review). To our knowledge and that of the authors, the kitten survival rate of 0.62 is the most recent and, as far as we know, most reliable; we do not have a more reliable rate for kitten survival to use.

Sensitivity analyses conducted by Karen Root of the Panther Subteam showed that juvenile survival was the most important variable of those used within the PVA (K. Root, Bowling Green State University, personal communication, 2003). Therefore, we are aware that uncertainty within this parameter may have the greatest consequences on the projected population performance or trajectory. We acknowledge that uncertainties exist, and that we are aware of them, however, we consider the 0.62 kitten survival rate the best available at this time. The Service and the FWC along with our partners will continue to monitor the panther population and the south Florida landscape and incorporate any new information and changes into our decision-making process.

We recognize that model parameters such as this can have effects on model outcomes. The Service is mindful of the limitations that exist, and when making decisions, we focus on the well being of the species.

3. Kautz et al. (In Review) does not include a definition of habitat.

We agree that specifically stating what constitutes panther habitat would be beneficial, however, we do not agree that lack of a definition should prevent use of Kautz et al. (In Review). Most biologists have an understanding of what habitat means. We believe that the Service and our counterparts understand what constitutes panther habitat. However, the Service considers panther habitat to be all areas required for the panther to live out its full life-cycle, including areas providing food and shelter and supporting characteristic movement such as hunting, breeding, dispersal, and territorial behavior.

4. We agreed on the Florida Panther Subteam on the importance of ranking land use categories on a scale of adverse to beneficial effects on panthers and evaluating proposed land use changes in the context of this scale. Randy Kautz felt that it would be redundant to include an explicit statement about this approach toward evaluating the impact to panthers of intensification of disturbance within zones.

The Service believes that ranking land use categories on a scale of adverse to beneficial effects on panthers and evaluating proposed land use changes in the context of this scale would be helpful, but is not necessarily needed to be part of Kautz et al. (In Review).

5. RAMAS PVA Assumptions: we need more discussion of the assumptions associated with the PVA and the degree to which we know these assumptions to be violated in the existing landscape and population.

We are aware of the assumptions used in the PVA analyses and consider these in our decisions. We will acknowledge the degree to which we believe any assumptions are being violated in our documents.

According to Kautz et al. (In Review), "All models assumed a 1:1 sex ratio, a stable age distribution, 50 percent of females breeding in any year, and an initial population of 41 females (82 individuals including males), the approximate population size in 2001-2002 (McBride 2001, 2002). The basic version of each model incorporated no catastrophes or epidemics, no change in habitat quality or amount, and a ceiling type of density dependence. The basic versions of the models incorporated a carrying capacity of 45 females (90 individuals) based on estimated population sizes likely to be supported by the Primary and Secondary Zones (see Sections 4.1 and 4.3)."

The Service acknowledges that some of these assumptions are violated and tries to factor the degrees to which assumptions may be violated into our decisions. For example, the Service is aware that the Panther Subteam had attempted to address the effects of habitat loss by assuming a 25 percent loss of panther habitat over the first 25 years (i.e., one percent per year) of the 100-year model simulation during their analyses. Although the probability of extinction only increases approximately one percent under this scenario, the mean final abundance of panthers was reduced by 26 percent to 31 to 38 females. The actual likelihood of population declines and extinction can be much higher than the guidelines suggest, depending upon the number of and severity of assumptions violated. The Service realizes that habitat loss is occurring at an estimated 0.8 percent loss of habitat per year (R. Kautz, personal communication, 2003). The Service has tried to account for habitat loss and changes in habitat quality within its regulatory program and specifically through its habitat assessment methodology. For example, we have increased the base ratio used within this methodology to account for unexpected increases in habitat loss. Similarly, we consider changes in habitat quality and encourage habitat restoration wherever appropriate.

With regard to the assumption of no catastrophes, the Service has considered the recent outbreak of feline leukemia in the panther population at Okaloacoochee Slough as a potential catastrophe. However, the FWC is carefully monitoring the situation and it appears to be under

control at this time due to a successful vaccination program. However, if the outbreak spreads into the population, the Service will consider this as a catastrophe and factor this into our decisions.

6. All three of the RAMAS PVA model scenarios (conservative, moderate, and optimistic) estimate the first year kitten survival rate at 62 percent, based on the Land/Linda kitten survival analysis from FWC annual panther reports (FWC 2001, repeated in 2002, 2003, 2004). However, the selective Land/Linda analysis omits without explanation many failed litters documented in denning tables in these same annual reports, resulting in estimates of survival rates that are too optimistic, especially for the purebred Florida component of the population where most failed litters occurred. Even when reliable rates are computed, PVA scenarios should incorporate a range of survival rates, since the high survival rate among introgressed litters in part reflects expansion into unoccupied areas of the range where there is less competition for space and prey. As such, rates could decrease as the range becomes saturated and as inbreeding effects may reappear in the population.

Per Tim O'Meara (FWC, personal communication, 2005), this does include litters that failed. The FWC annual report does include all litters for which FWC was able to get into the den and determine outcome of litters 6 months later; if litters were not included it was because they did not meet those criteria (T. O'Meara, personal communication, 2005). We agree that incorporating a range of kitten survivals into various PVA models would be beneficial in the future. To our knowledge, the kitten survival rate of 0.62 is the most recent and most reliable estimate to use at this time. We will continue to use this estimate until a more reliable estimate is available.

7. We should include a statement acknowledging that the SRT has found serious errors in panther science and has recommended reanalysis of baseline data for the population. We should acknowledge that, as a result of errors, PVA parameter values may have been overestimated, leading to PVA results that may be too optimistic. In the meantime, decisions should err on the side of the panther.

The Service agrees that the SRT has found serious errors in the scientific literature related to the panther and that reanalysis of baseline demographic data for the population should be done. The SRT has made numerous recommendations and the FWC and the Service are in the process of prioritizing these based upon need and importance to panther recovery. We realize that PVAs, like any model or analyses, are only as good as the assumptions, parameters, and data used. We believe that Kautz et al. (In Review) used the best available estimates for the parameters within the PVA. We realize that there is a possibility that the PVA results may be too optimistic. We agree that our decisions should err on the side of the panther.

Endangered Species Act/Information Quality Act

1. The ESA states that the Service "shall use the best scientific and commercial data available." However, the vegetation data and land use/land cover maps, as well as the panther telemetry points are several years old.

Most information must be analyzed before it is of use to us. Due to the time for analysis and the extensive and lengthy peer review and publication process, it is not possible for an article to be published in a professional journal before the data becomes several months to a few years old as is the case in this instance. We believe that Kautz et al. (In Review) is an appropriate and valid addition to the body of science and it adds to the "best scientific and commercial data available," however, part of the base data and maps are not necessarily the most current.

2. The Information Quality Act Challenge states "The estimate of an 80% pre-introgression kitten survival rate in Maehr et al. (1999, 2002) was based on an indefensible estimate Maehr and Caddick (1995) that was unsupported by data (Beier et al. 2003:47, 49, 143-144)."

Kautz et al. (In Review) used the more current and realistic survival rate of 0.62. This issue is also addressed above in Question 3 within the Scientific Review Team section, and in Questions 2 and 6 within the Dr. Jane Comiskey section.